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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/633,159

Filing Date: August 01, 2003

Appellant(s): OIZUMI ET AL.

Carlton H. Hoel
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/12/07 appealing from the Office action
mailed 6/25/07.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

7,023,487	Adams	4-2006
6,339,451	Tults	1-2002
5,054,100	Tai	10-1991

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The appellant has identified interpolation to correspond to an equation on page 7, line 7 of the specification. However, the specification does not disclose that the equation is interpolation and instead describes the equation in the context of filtering. Would one of ordinary skill in the art of image processing conclude that the equation is interpolation or filtering or are equivalent?

Interpolation according to Tai (US Patent 5,054,100) discloses an interpolation equation as shown in col. 4, equation (1). The only reason that the examiner knows that equation (1) is an interpolation equation is because Tai clearly identifies the equation to be "bilinear interpolation" in col. 4, line 19.

In contrast, the equation on page 7, line 7 of the appellant's specification appears to be similar to Tai's equation and may or may not be interpolation; however, the specification does not clearly identify the equation to be interpolation or bilinear interpolation as clearly pointed out in Tai.

If the appellant's equation was a special form of interpolation, the examiner suggests that "interpolation" should have been clearly associated with the equation since the equation does not make common sense in terms of interpolation. The examiner's common sense understanding of interpolation is an averaging process such as summing two values and dividing by two or even in light of Tai that uses bilinear interpolation. The examiner cannot begin to understand how the equation can perform averaging since there is no division of a sum or bilinear interpolation. The examiner cannot assume that the equation is interpolation just by the equation alone. Thus, the 35 USC 112 rejection is maintained as clearly described, above.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1,2 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Tai (US Patent 5,054,100 A1).

Regarding claim 1, Tai discloses a method of image filtering, comprising:

- (a) computing edge intensity and direction for each pixel in an image (fig. 7,num. 34);
- (b) filtering said image with a filter which, for each pixel, smoothes in a direction parallel to the edge found in step (a) for said each pixel (fig. 5: limitations (a) and (b) are well known as edge sharpening to one of ordinary skill in the art of edge filtering);
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight due to the 35 USC 112 rejection, above).

Regarding claim 2, Tai discloses the method of claim 1, wherein:

- (a) said computing step (a) of claim 1 includes:
 - (i) computing variations in pixel values for horizontal, vertical, and diagonals at said each pixel (fig. 7,num. 34); and
 - (ii) computing edge direction and intensity from said variations of (i)(fig. 7,num. 36).

Regarding claim 4, Tai discloses the method of claim 1, wherein:

(a) said filter of step (b) of claim 1 for said each pixel is a matrix (as shown in fig. 2) which depends upon $r=d_x/d_y$ (the structural relationship of the formula is not given patentable weight and will be interpreted as an equation as disclosed as equation (4) in column 5 with variables) with d_x (or " x_0 " in equation (4)) is a measure of variation in the x-direction at said each pixel and d_y (or " y_0 " in equation (4)) is a measure of variation in the x-direction at said each pixel.

4. Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Tults (US Patent 6,339,451 B1).

Regarding claim 1, Tults discloses a method of image filtering, comprising:

- (a) computing edge intensity (as indicated in fig. 3) and direction (as indicated in figures 6a-6d) for each pixel in an image;
- (b) filtering (via fig. 7,um. 112) said image with a filter which, for each pixel, smoothes (as shown in figure 2,num. 6 relative to fig. 1,num. 2) in a direction parallel to the edge found in step (a) for said each pixel;
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight due to the 35 USC 112 rejection, above).

Regarding claim 5, Tults discloses the method of claim 1, wherein:

- (a) said image is a color channel (or "color signals R,G and B" in col. 8, line 55) of a color image.

5. Claims 1 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by Adams (US Patent 7,023,487 B1).

Regarding claim 1, Adams discloses a method of image filtering, comprising:

- (a) computing edge intensity and direction for each pixel in an image (as indicated in fig. 2A, numerals 42 and 44);
- (b) filtering said image with a filter (as indicated in fig. 2B as "HighPass Filter Direction) which, for each pixel, smoothes in a direction parallel (as indicated by the plurality of arrows in fig. 3A, num. 58) to the edge found in step (a) for said each pixel;
- (c) interpolating said image and said filtered image from step (b) wherein said interpolating at said each pixel depends upon said intensity found in step (a) (limitation (c) is not given patentable weight due to the 35 USC 112 rejection, above).

Regarding claim 3, Adams discloses the method of claim 1, wherein:

- (a) said filter of step (b) of claim 1 for said each pixel is a rotation (indicated in fig. 2A as num. 44) according to said edge direction of step (a) of claim 1 of a fixed filter.

(10) Response to Argument

6. Appellant's arguments on page 3, lines 21,22 of the Appeal Brief filed 9/12/07 have been fully considered but they are not persuasive and states:

"Application page 7, line 7 recites the equation

$$p^{new}(n,m) = I(n,m) = I(n,m) q(n,m) + [1 - I(n,m)] p(n,m)$$

The examiner respectfully disagrees since the application page 7, line 7 recites the equation:

$$P^{\text{new}}(n,m) = \alpha I(n,m) q(n,m) + [1-\alpha I(n,m)]p(n,m)$$

which is different as presented in the appeal brief on page 3 since at least "α" is missing from the equation in the appeal brief on page 3.

7. Appellant's arguments on page 3, line 25-27 of the Appeal Brief filed 9/12/07 have been fully considered but they are not persuasive and states:

"Note that this [the above mentioned equation in paragraph 6, above] is linear interpolation which is a weighted sum. Consequently, the application supports claim 1."

The examiner respectfully disagrees since "linear interpolation which is a weighted sum" was not disclosed in the specification and appears to be new matter; thus, support for claim 1 was not established. The examiner agrees with the appellant that the equation is a weighted sum, but the examiner cannot assume that since the equation is a weighted sum then the equation is exclusively interpolation since the possibility that other weighted sums can be used for other operations exists. Thus, as clearly described above, support for claim 1 was not established.

8. Appellant's arguments on page 4, lines 3,4 of the Appeal Brief filed 9/12/07 have been fully considered but they are not persuasive and states:

“Tai does not suggest the interpolating of step c) of base claim 1...”

The examiner respectfully disagrees, because regardless if Tai even teaches the minimum of interpolation of step c) of base claim 1, this argument is moot due to the 35 USC 112 rejection that takes precedence in establishing whether interpolation ought to be included in claim 1.

Note that Tai does disclose interpolation as shown in fig. 6, num. 24; thus, Tai does suggest the interpolating of step c) of base claim 1.

9. Appellant's arguments on page 4, lines 8,9 of the Appeal Brief filed 9/12/07 have been fully considered but they are not persuasive and states:

“Tults does not suggest the interpolating of step c) of base claim 1...”

The examiner respectfully disagrees, because regardless if Tults even teaches the minimum of interpolation of step c) of base claim 1, this argument is moot due to the 35 USC 112 rejection that takes precedence in establishing whether interpolation ought to be included in claim 1.

Note that Tults does not disclose interpolation. Thus, the examiner agrees with the appellant that Tults does not suggest the interpolating of step c) of base claim 1.

Art Unit: 2624

10. Appellant's arguments on page 4, lines 14,15 of the Appeal Brief filed 9/12/07 have been fully considered but they are not persuasive and states:

"Adams does not suggest the interpolating of step c) of base claim 1..."

The examiner respectfully disagrees, because regardless if Adams even teaches the minimum of interpolation of step c) of base claim 1, this argument is moot due to the 35 USC 112 rejection that takes precedence in establishing whether interpolation ought to be included in claim 1.

Note that Adams does disclose interpolation corresponding to "interpolating" in col. 3, line 6 and "cubic curve fit" in col. 16, lines 11,41 and "averaged" in col. 16, lines 28,34,38 and "averages" in col. 16, line 41; thus, Adams does suggest the interpolating of step c) of base claim 1.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Dennis Rosario

DR

Conferees:

Matthew Bella


MATTHEW C. BELLA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600


JINGGE WU
SUPERVISORY PATENT EXAMINER